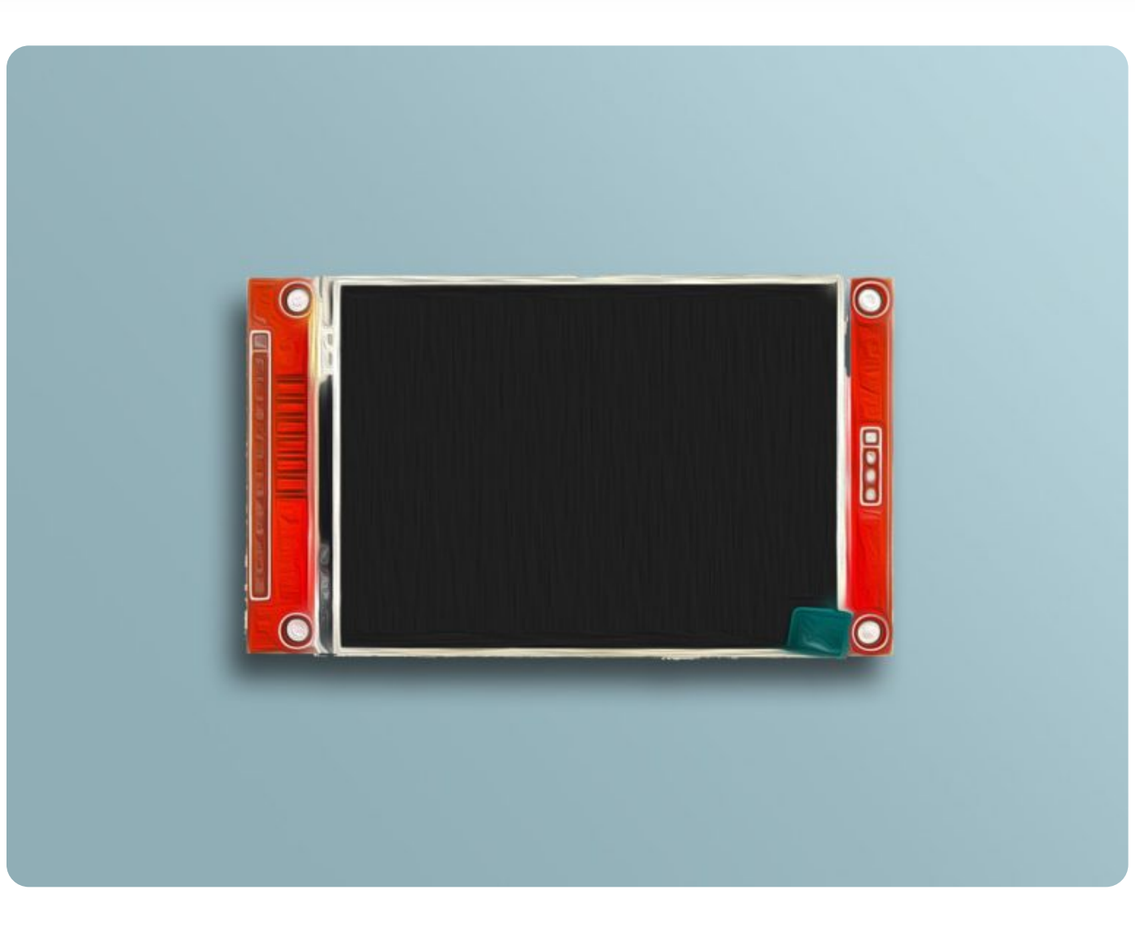
LCDs & Displays

Interfacing 2.8 INCH TFT LCD Touch Screen with ESP32



Written by Mohammad Damirchi

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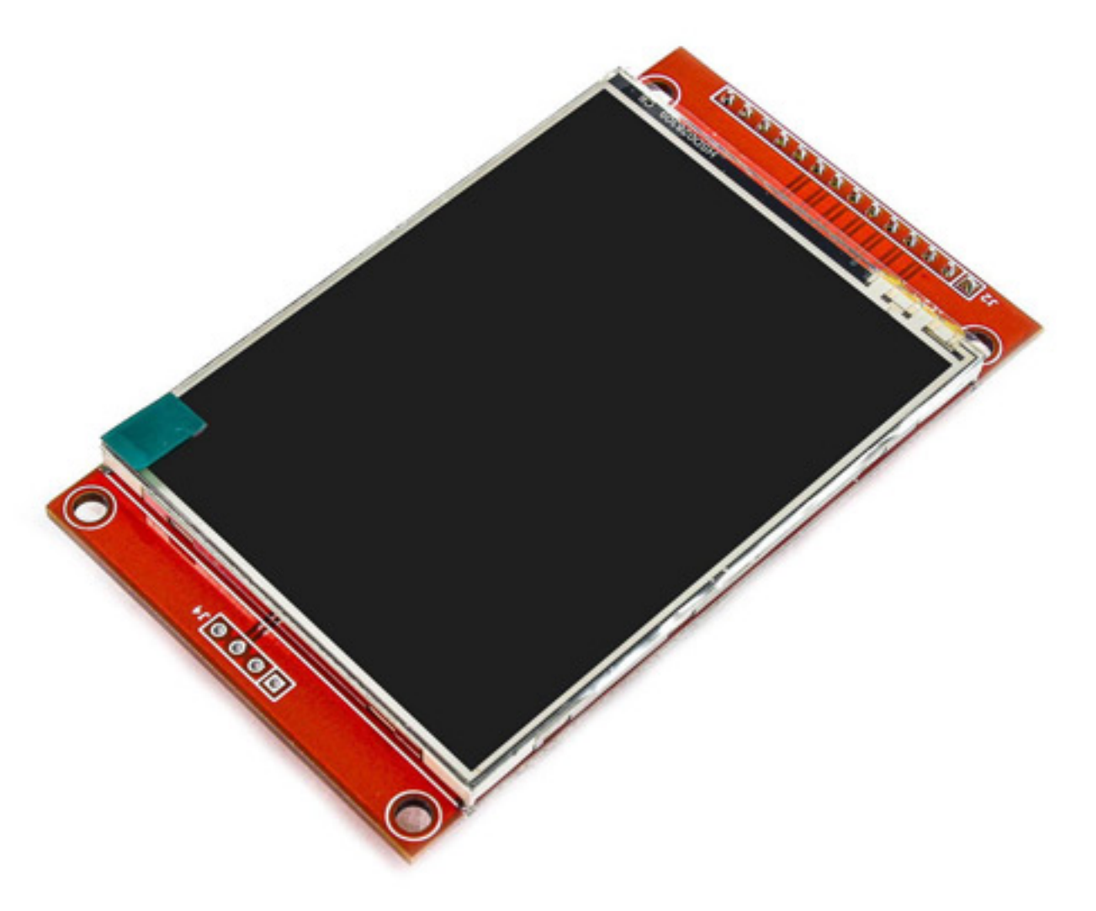
2.8 INCH TFT LCD Display Features

The TFT display is a kind of LCD that is connected to each pixel using a transistor and it features low current consumption, high-quality, high-resolution and backlight. This 2.8-inch full color LCD has a narrow PCB display. The resolution is 320×280 pixels and it has a four-wire SPI interface and white backlight.

This display also has a touch screen and SD card slot.

Note

The module voltage is 3.3V and voltage divider is required to interface it with Arduino.



To download datasheet and for more details, refer to link below.

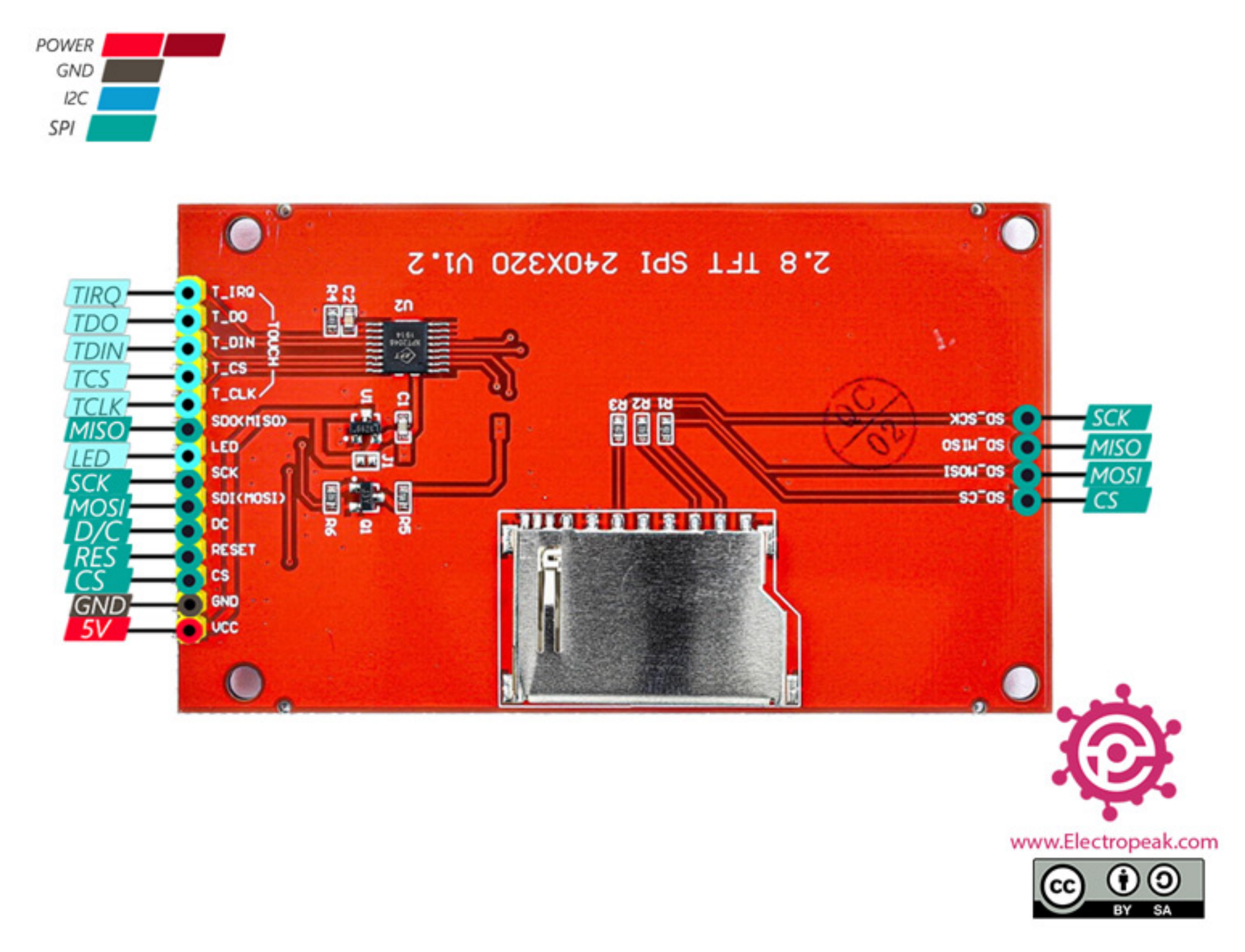
http://www.lcdwiki.com/2.8inch_SPI_Module_ILI9341_SKU:MSP2807

2.8 INCH TFT LCD Display Pinout

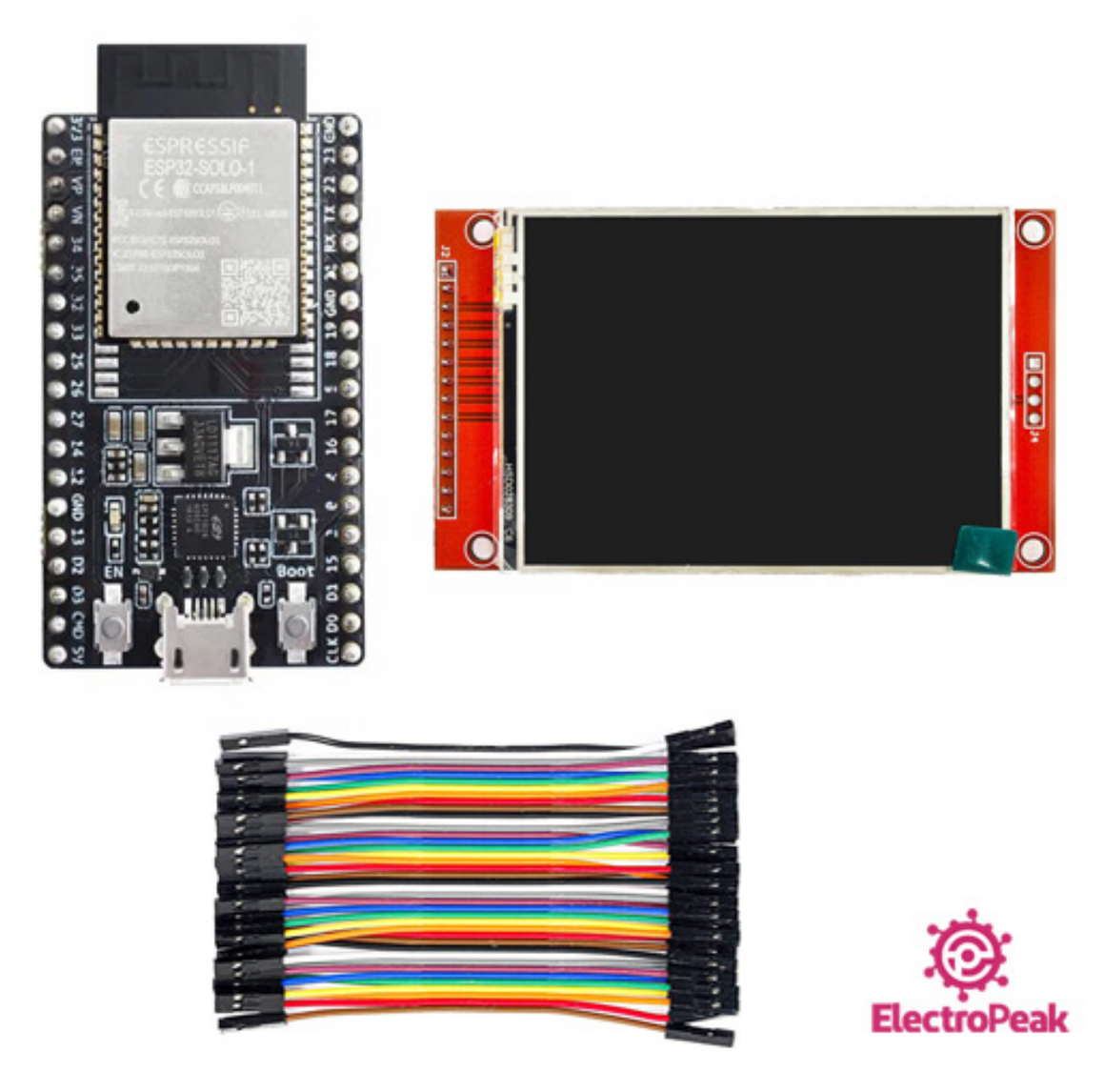
This module has 20 pins:

- **VIN**: Module power supply – 3.3-5 V
- **GND**: Ground
- **RST**: LCD reset
- **CS**: LCD chip select signal, low level enable
- **D/C**: Data selection signal
- **MOSI:** SPI bus write data signal
- **SCK:** SPI bus clock signal
- **LED:** Backlight control
- **T_CLK:** Touch SPI bus clock signal
- **T_CS:** Touch screen chip select signal, low level enable
- **T_DIN:** Touch SPI bus input
- **T_DO:** Touch SPI bus input
- **T_IRQ:** Touch screen interrupt signal, low level when touch is detected
- **SD-MOSI:** SPI bus write data signal
- **SD-MISO:** SPI bus read data signal, if you do not need to the read function, you can not connect it
- **SD-SCK:** SPI bus clock signal
- **SD-CS:** Chip select signal for SPI protocol (SD Card)

You can see the pinout of this module in the image below.



Required Materials



Hardware Components

ESP32	×	1
2.8 inch IPS Full Color Touch TFT Display Module	×	1
Female to Female jumper wire	×	1

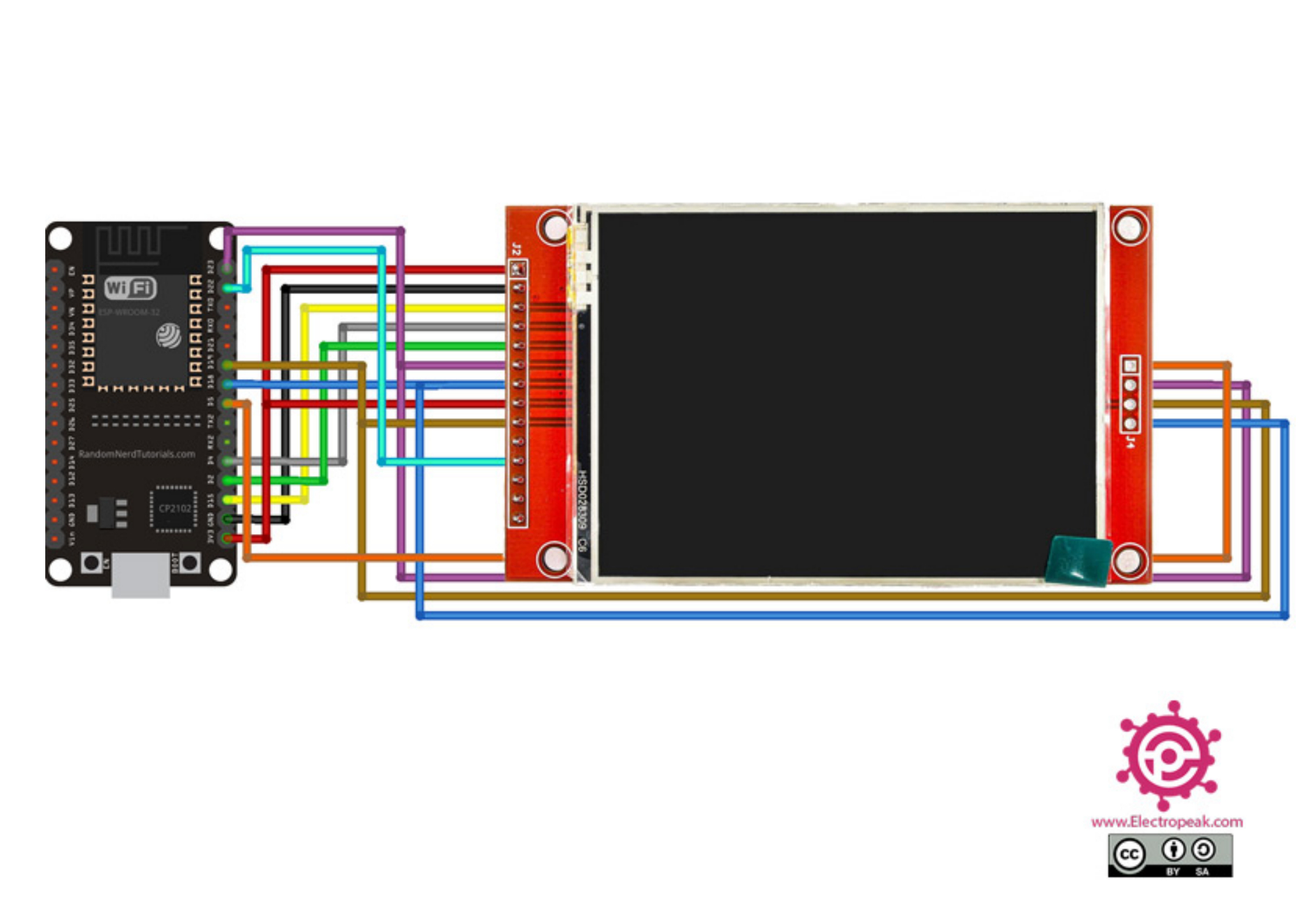
Software Apps

Arduino IDE

Interfacing 2.8 INCH TFT LCD Display with ESP32

Step 1: Circuit

The following circuit shows how you should connect ESP32 to this Display. Connect wires accordingly.



Step 2: Library

First, install the following library in Arduino IDE.

https://github.com/Bodmer/TFT_eSPI

After that, go to the address of installed library and open the **User_Setup.h** file and refer to line

EDIT THE PIN NUMBERS IN THE LINES FOLLOWING TO SUIT YOUR ESP32 SETUP

and uncomment the following lines and comment on the lines which are uncommented.

#define TFT_MISO 19

#define TFT_MOSI 23

#define TFT_SCLK 18

#define TFT_CS 15 // Chip select control pin

#define TFT_DC 2 // Data Command control pin

#define TFT_RST 4 // Reset pin (could connect to RST pin)

You can also download the ready file from here, unzip it and use in your project.

Step 3: Code

Upload the following code to your ESP32.

```
uint16_t osx = 120, osy = 120; // Saved x & y coords
uint32_t updateTime = 0;       // time for next update

int old_analog =  -999; // Value last displayed
int old_digital = -999; // Value last displayed

int value[6] = {0, 0, 0, 0, 0, 0};
int old_value[6] = { -1, -1, -1, -1, -1, -1};
int d = 0;

void setup(void) {
  tft.init();
  tft.setRotation(0);
  Serial.begin(57600); // For debug
  tft.fillScreen(TFT_BLACK);

  analogMeter(); // Draw analogue meter

  // Draw 6 linear meters
  byte d = 40;
  plotLinear("A0", 0, 160);
  plotLinear("A1", 1 * d, 160);
  plotLinear("A2", 2 * d, 160);
  plotLinear("A3", 3 * d, 160);
  plotLinear("A4", 4 * d, 160);
  plotLinear("A5", 5 * d, 160);

  updateTime = millis(); // Next update time
}
```

This code is for testing the display and shows various graphical shapes and designs.

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Comments (4)

Jerry Renken Reply

Mohammad: This is an impressive posting! I have been looking for this type of post in order to interface my DOIT ESP32 DEVKIT V1 to my 2.8-inch SPI TFT MSP2807 Display. I have made a successful interface between my Arduino UNO Rev 3 Module and the MSP2807 Display. However, I wish to move away from using 10 pairs of series connected step down voltage divider resistors.
I need some help from you to configure my user setup file for my application. I am using the MSP2807 Display with the ILI9341 Driver, driven by the DOIT ESP32 DEVKIT V1. I have placed the DOIT ESP32 DEVKIT V1 Board File into my IDE Board List.
Please help me to configure my attached User File to make this happen. I would like to e-mail the following documents to you:
1. A PDF showing a close up drawing for the DOIT ESP32 DEVKIT V1 with all of its pin outs identified
2. A PDF showing the connection between this ESP32 Module and the MSP2807, taken from this posting; a larger drawing of the ESP32 Module by itself; and a table summarizing the interconnections shown in your connection drawing at the top of this figure .
3. A copy of your "Animated Analog Meter" sketch with the User Setup File pasted on top of the sketch.
How can I send these items to you?

December 12, 2021 at 5:13 pm

john Reply

please explain, dumbass. how do you connect 3 pins from the required materials with one wire? fucking copy-paste

December 18, 2022 at 1:33 pm

Ali Abdolmaleki Reply

please let me know dirty john. do you have any expereince with SPI interface?

February 15, 2023 at 2:40 pm

Kevin Reply

Thanks for the post. It worked for me right away. Saved me a lot of time.

February 8, 2023 at 12:35 am

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